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ABSTRACT

As Phase IV of a comprehensive evaluation of the NASA-affiliated Langley Research Center's (LaRC) scientific and technical information (STI) program, a study was conducted to assess the usage, importance, and perceived quality of Langley-generated STI among academic and industrial research personnel, and to determine ways in which that information could be made more accessible to potential users. To obtain feedback on the STI program's effectiveness, a survey questionnaire prepared jointly by the evaluation project director and Continental Research was sent to 497 academic and industrial engineers and scientists who agreed to participate in the study. Of these, 381 returned the questionnaires by the deadline, computer tabulations were performed, and the responses were summarized. Analysis of the data revealed that NASA STI was important to the research conducted by the majority of the survey respondents, although a significant lack of familiarity with selected NASA STI products and services among the survey population was indicated. Survey data are categorized by topic and presented in 13 tables. Included are recommendations, a reference list and six appendices, among which are the project plan for the review of LaRC STI services and a copy of the survey instrument. (Author/JI)

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A Review and Evaluation of the Langley Research Center's Scientific and Technical Information Program

Results of Phase IV - Knowledge and Attitudes Survey, Academic and Industrial Personnel

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INTRODUCTION

A comprehensive review and evaluation of the Langley Research Center's scientific and technical information (STI) program was conducted. The purpose of the review and evaluation was to determine the extent to which the program was meeting the needs of the Langley research personnel and the recipients of Langley-generated STI, the areas of the program which needed improvement, and the ways in which the program could be modified to improve its overall efficiency and effectiveness. The goal of the review and evaluation project was to determine if the dissemination of the Center's research output could be made more effective.

The project utilized both survey research and systems analysis techniques. A steering committee composed of one representative from each research division was used to develop the objectives and guide the project through its completion. The individual tasks required to accomplish the objectives were established and were included as phases in the project plan which is Appendix A of this report. The results of Phase IV - Knowledge and Attitudes Survey, Academic and Industrial Personnel are contained in this report.

STATEMENT OF THE PROBLEM

During the 63-year history of the Langley Research Center, a comprehensive review and evaluation of the Center's STI program had never been conducted. Portions of the Langley STI program had received periodic or occasional assessment; however, no valid empirical data existed which could be used to evaluate the overall program.

Purpose of the Study

The purpose of Phase IV was to determine the knowledge of and attitudes toward Langley and NASA scientific and technical information (STI) held by the external user population. Phase IV utilized survey research to assess the usage, importance, and perceived quality of NASA Langley-generated STI and the familiarity with and use of selected NASA publications and services and to determine ways in which Langley-generated STI could be made more accessible to external users.

Objectives of the Study

Seven objectives were established for Phase IV. These objectives were to

1. Assess the familiarity with and frequency of use of selected NASA STI publications and services;

2. Assess the importance of NASA STI and Langley-authored (published) STI in terms of "advancing the state-of-the-art";

3. Determine the frequency of ordering and the relative speed of delivery for NASA technical reports;

4. Determine the use of non-NASA, NASA-authored, and Langley-authored (published) STI;

5. Gather data as to the technical quality, the adequacy of data, the organization (format), and the quality of visual presentation to determine the perceived image of Langley-authored (published) STI;

6. Ascertain specific demographic information such as work experience, type of research organization, professional duties, major field of interest, and publication activities about the survey participants; and

7. Identify ways in which Langley-generated STI could be made more accessible to non-NASA engineers and scientists.

Setting for the Study

The Langley Research Center (LaRC) is one of the leading national laboratories for research and development in the sciences of aeronautics and space technology. Founded in 1917, Langley was the nucleus for the former National Advisory Committee for Aeronautics (NACA). For more than 60 years, Langley engineers and scientists have conducted basic and applied research in fluid and flight mechanics, flight systems, structures and materials, acoustics and noise reduction, measurements and instrumentation systems, data systems, and space and Earth sciences. For calendar year 1980, Langley's 1,306 engineers and scientists produced 1127 items which included 175 NASA formal series technical publications, 136 NASA Quick-Release Technical Memorandums, 146 journal articles, 352 conference/meeting papers, 85 NASA Tech Briefs, 10 NASA computer programs, 20 patents, and 203 pieces of unpublished research. The documented research output of the Langley Research Center is processed through the Langley Research Information and Applications Division (RIAD), which is an integral part of the NASA Scientific and Technical Information system.

Importance of the Study

An evaluation of the Langley STI program which included a survey of recipients/users in academia and industry had never been conducted. The feedback obtained from the completed questionnaire provided an assessment of Langley and NASA STI products and outputs, established a baseline for future evaluative efforts, and identified ways to increase the accessibility of Langley STI. The questionnaire could be re-administered as part of an on-going evaluation of the Langley STI program.

Scope of the Study

The study was limited to (1) the scientific and technical information output of the Langley Research Center as processed through the Langley STI program; (2) selected NASA STI publications and services; (3) books, periodicals, and research specifically concerned with scientific and technical information; (4) studies specifically concerned with the Langley STI program and the NASA STI system; and (5) completed questionnaires received from the survey population. The survey population consisted of academic and industrial engineers and scientists. The study spanned the period from December 1980 to February 1981.

GLOSSARY

IAA	International Aerospace Abstracts
LaRC	Langley Research Center
LSTAR	Limited Scientific and Technical Aerospace Reports
n	Sample Size
NACA	National Advisory Committee for Aeronautics
NASA	National Aeronautics and Space Administration
NTIS	National Technical Information Service
OMB	Office of Management and Budget
RECON	Remote Console
RIAD	Research Information and Applications Division
SCAN	Selected Current Aerospace Notices
STAR	Scientific and Technical Aerospace Reports
STI	Scientific and Technical Information
SP	Special Publication

RELATED RESEARCH AND LITERATURE

The review of related research and literature emphasized that periodic evaluation was essential to the management of information systems. When properly conducted, evaluation disclosed the strengths and weaknesses of the system, suggested ways to improve the overall performance of the system, and ultimately improved the efficiency and effectiveness of the system (King and Bryant, 1971). The literature emphasized that the total evaluation of an information system encompassed all the program objectives and employed a variety of management tools and techniques (Swanson, 1975). It was established that the information needs of the user were a necessary dimension in the evaluation process (Debons and Montgomery, 1974).

EVALUATION OF THE NASA STI SYSTEM

Since its inception, various aspects of the NASA STI system were evaluated. Both programmatic and user oriented studies were conducted. The programmatic studies were concerned with funding levels, manpower authorization, and the location of the STI function within the NASA organization (Duberg, 1973). The user studies sought to determine the effectiveness of the NASA STI system by obtaining feedback from the user population. The first Agency-wide user study of the NASA STI system occurred in 1973. Since 1973, a series of user studies have been conducted. These studies were reviewed and summarized.

The Drobka Study

In 1973, the first Agency-wide evaluation of the NASA STI program was undertaken by F. George Drobka, then Head of the Acquisitions and Dissemination Branch, Headquarters STI office. The study utilized the technique of structured interviews with a representative sample of users. From a population of 114 mid-level engineers and scientists at 10 NASA centers and prime contractor facilities, an assessment of the usefulness of NASA STI products and services was obtained and recommendations for making the system more effective were established.

The NASA STI system was perceived as the best single source for needed aerospace information. The majority of researchers used the announcement media, STAR (67%), IAA (56%), SCAN (51%), and RECON (52%). Nevertheless, the respondents displayed "fragmentary knowledge of (1) the scope and coverage of our system and (2) our document distribution mechanism" (Pryor, 1975).

Action was taken by NASA to satisfy other users needs and improve the system: STAR coverage of on-going projects was provided; the subject-category schemes for the announcement media were revised and expanded; access to additional data bases was supplied; quicker RECON response was accomplished; LSTAR, a quarterly journal of security classified and administratively limited documents was initiated; and a copy of PROFILES, a publication describing all NASA products and services, was offered to each scientist and engineer (Pryor, 1976).

The Burr Study

In 1978, a second Agency-wide evaluation of the NASA STI program was undertaken by Dr. Richard E. Burr, then a Federal Faculty Fellow assigned to the NASA Headquarters STI Branch. As with the Drobka study, Burr's methodology utilized structured interviews. Interviewees included 76 scientists and engineers at seven NASA centers.

The Burr study, as did the Drobka study, exhibited the evaluation objectives connected with the second type of user study described by King and Bryant (1971). Like the Drobka study, the Burr study (1978) assessed the usefulness of the STI system in meeting the users' needs, elicited ways in which the system could be improved, and documented user awareness of the scope and coverage of the NASA STI products and services. In-depth evaluation of the NASA STI products and services was obtained, including ease of use, purpose of use, and adequacy of announcement abstracts and categories. An evaluation of the acquisition and dissemination activities was established and an assessment of the changes installed after the Drobka study was documented.

Most respondents (82%) indicated that the NASA STI system generally met their needs. Almost 80 percent considered the media and services easy to use, and at least 85 percent considered the announcement abstracts adequate. Levels of system utilization increased for RECON to 79 percent, 27 percent above levels recorded in the Drobka study. The use of three major media, however,

declined from the 1973-1974 levels. STAR use declined from 67 percent to 45 percent, IAA use from 56 percent to 34 percent, and SCAN use from 51 percent to 45 percent. Half the respondents did not think that they were made aware of all the NASA publications and products which might be applicable to their work. Almost two-thirds (62%) stated that it would be useful for their installation to conduct training programs on NASA products and services. The majority rated the system's acquisition and dissemination activities as good or excellent. Reaction to the changes instituted after the Drobka study was less positive. Assessment of the revised subject categories was very mixed. On the average, only 43 percent of the respondents recognized PROFILES, the publication which described the products and services. Familiarity with and use of the LSTAR was almost nonexistent.

The Monge Study

In 1978, the Ames Research Center contracted with Communimetrics, Inc. to undertake an evaluation of NASA STI from the viewpoint of non-NASA users in the aeronautical industry. Monge (1979) based The Assessment of NASA Technical Information on data obtained from 450 employees in 40 of the 49 major aeronautical companies. Three methods of obtaining information were used: a questionnaire containing open- and closed-ended questions, structured interviews, and a multidimensional scaling technique. Data were obtained in these major areas: the efficiency and timeliness of the dissemination process; the method through which the respondent became aware of NASA STI; utilization of NASA STI; usage of a specific announcement medium, STAR; a comparison of documents published by NACA and NASA; suggested improvements in NASA STI; and the image of NASA STI.

Three groups of users were identified and queried during the Monge study: librarians, executives, and researchers. The Monge study established that industry's corporate libraries were a critical link in the dissemination of NASA STI. The largest group of users learned about NASA documents through library publications (30%). Documents on automatic distribution were not received 20 percent of the time. It was recommended that a manual on ordering and distribution processes be distributed to all aeronautical industry librarians.

For executives and researchers, NASA was the second most important source of technical information (after technical journals). Executives used NASA documents 27 times per year. Researchers used NASA documents 32 times per year and read NASA-authored journal articles 17 times per year. Seventy-one percent said that STAR reports were important or very important in maintaining current awareness. Current awareness was clearly the most significant use for STAR reports. Citation of STAR reports was low for in-house publication (26%) and in other technical publications (10%). A comparison of NACA and NASA documents was obtained from executives, 90 percent of whom had direct experience with NACA. Criticism of NASA STI reflected, in part, a desire for a return to the comprehensive and exhaustive publications which NACA had produced when the organization's sole focus was aeronautical problems. The two major inadequacies of STI content were identified as the failure to relate the research to existing knowledge and to include complete data and information in reports. It was recommended that related research sections be included in each report and that state-of-the-art publications be produced periodically by NASA in major aeronautical subjects. It was also recommended that the organization of reports be modified to highlight key information in the abstracts, the summaries, and in the reports themselves. The results of the multidimensional scaling technique suggested strategies for moving the image of NASA STI closer to the job concepts of aeronautical researchers. To extend awareness and use of NASA STI, it was recommended that a brochure presenting the NASA system in the terms and concepts most important to users should be circulated throughout the aeronautical industry.

EVALUATION OF THE LANGLEY STI PROGRAM

The Langley Research Center STI program is an integral part of the Agency's STI system and is responsible for implementing Agency and Center policies concerning the management of STI. Expeditious publication of the Center's research output is Langley's contribution to the Agency's goal of timely dissemination of NASA research. The documented research output of the Center is processed through the Langley Research Information and Applications Division (RIAD). In addition, the Publications Branch of RIAD provides in house printing for NASA Headquarters, Scientific and Technical Information Branch.

This service is provided for the entire Agency and involves the publication and dissemination of NASA's formal series technical publications.

Since 1970, a series of audits and studies were conducted for portions of the Langley STI program. The audits and studies were programmatic in nature and were concerned with cost effectiveness. With the exception of an evaluation of the Langley Technical Library (Dewhirst, 1970), no attempt had been made to determine the effectiveness of the Langley STI program or portions of the program by obtaining feedback from the user population.

In February 1980, a comprehensive review and evaluation of the Langley STI program was undertaken. Phase I of the review and evaluation project (Pinelli, et. al., 1980) represented the first attempt to obtain feedback from Langley engineers and scientists, the internal user population. A study designed to solicit feedback from academic and industrial engineers and scientists, the external population, had not been conducted.

RESEARCH METHODOLOGY AND PROCEDURE

The study utilized survey research to obtain feedback from academic and industrial engineers and scientists. The study was conducted in conjunction with Continental Research Company. Professional research assistance was utilized to establish and ensure objectivity and confidentiality, to maintain the integrity of the study, and to obtain research skills not readily available to the project.

Research Methodology

The methodology for the survey portion of the study involved the use of non-probability techniques (Kress, 1979). (For a discussion of this concept, see Wentz, 1972, and Bellenger and Greenberg, 1978.) The use of non-probability techniques were chosen because the size and membership of the universe were not known (Boyd, Westfall, and Stasch, 1977). Further justification for employing non-probability techniques existed because of the administrative difficulty/cost involved in identifying the universe (Warwick and Lininger, 1975).

A sample based on the NASA distribution list for formal reports was not used because the distribution was composed of organizations and institutions rather than individual users. The sample population was therefore based on the names of active researchers furnished by members of the steering committee.

Research Procedure

Stage 1 of a four-stage survey procedure involved the development of the sampling frame. Members of the review and evaluation steering committee were asked to obtain a list of industrial and academic professionals active in their research field from engineers and scientists within their respective divisions. Names, addresses, and phone numbers were requested for each individual. The compiled lists, representing all the areas in which Langley conducted research, were forwarded to STIPD. Approximately 1,200 names were submitted, of which less than 2 percent had been or were contractors or grantees.

Stage 2 of the research procedures involved the verification of the sample frame addresses. From approximately 1,200 submittals, duplicate names and those with inadequate addresses were deleted. Addresses and telephone numbers/extensions were checked for the remaining academic professionals. The addresses and telephone numbers/extensions were checked for the industrial professionals. Those professionals who were no longer employed by the organization/institution and for whom no current address could be obtained were deleted. Approximately 600 of the addresses were verified.

Stage 3 involved the construction of the survey questionnaire. The survey questionnaire contained 35 closed-ended questions and three open-ended items. The open-ended items were listed on a separate sheet and were included as a supplement to the questionnaire. The closed-ended questions employed four and five-point attitude scales (Fishbein and Ajzen, 1975). The survey was designed to assess the usage, importance, and perceived quality of NASA Langley-generated STI and the use of selected NASA STI publications and services. The questionnaire was prepared jointly by Continental Research and the project director's team. Each question on the survey was pretested on representative members of the sample, reviewed by members of the project's steering committee, and revised by Continental Research. The questions were designed to measure the respondents' knowledge of and attitudes toward Langley and NASA STI; to assess the usage, importance, and perceived quality of NASA Langley-generated STI; and to determine

their familiarity with and use of related NASA publications and services. In addition, demographic characteristics were obtained. The final survey instrument, including the open-ended supplement, is contained in Appendix B.

Stage 4 involved the conduct of the survey. This stage involved a four-step method combining the personal touch of telephone interviews with the depth of information possible in a mail survey (Dillman, 1978).

Step 1 - Each person from the sample frame of 611 usable names was telephoned during the week beginning November 30, 1980. Each individual was asked to participate in the evaluation project by completing a mail questionnaire. The results of these calls were as follows:

81.3% - willing to participate
10.8% - out of town
5.6% - never reached (after many tries)
2.3% - unwilling to participate

Step 2 - Each of the 497 persons who agreed to participate was mailed a questionnaire within 24 hours. The questionnaire, which was sent with a cover letter signed by the president of Continental Research, contained a brief message thanking the individual for his/her participation. (Appendix C.)

Step 3 - Of the 497 potential respondents who were mailed questionnaires, 471 received a follow-up phone call during the week beginning December 7, 1980. This call served as a reminder to those who had forgotten about the survey and as a thank you call to those who had returned their surveys. The balance of those people who were not reached by phone were sent letters of appreciation (Appendix D).

Step 4 - The surveys were returned by mail. The cut-off date for inclusion in the computerized analysis was January 1, 1981. Over 80 percent of those who were sent surveys returned them in time. A total of 381 usable surveys were included in the computer analysis. As of January 28, 1981, 421 had been returned, making the final response rate 85 percent.

The 381 questionnaires that were returned by the deadline were thoroughly edited and computer coded. Computer tabulations were performed and the responses were summarized. Appendix E shows the aggregated tallies of these questionnaires. Appendix F displays these tallies calculated without the "don't know" responses.

PRESENTATION OF THE DATA

The responses to the closed-ended and open-ended questions were presented for each survey topic. One hundred sixty responses were received to the open-ended questions. The results were compiled and were included according to the survey topic to which they applied.

The number of responses to each question is provided. The numbers (n) contained in each table represent absolute percentages based on the survey population (n = 381) rather than the n for a given question. For discussion purposes, the headings "usually" and "sometimes" were combined, as were the headings "very" and "somewhat."

Survey Topic 1: Assess the Familiarity With and Use of Selected NASA STI Publications and Services

Academic and industrial personnel were asked to respond to three questions which pertained to familiarity with and use of selected NASA STI publications and services. Questions pertinent to each topic were presented and analyzed separately.

Familiarity With Selected NASA STI Publications. Two questions were used to determine the familiarity with NASA STI publications. The results were summarized and are presented in Table A.

TABLE A

Summary: Subscription/Receipt of Selected NASA STI Publications

PERCENTAGES

Does your institution or organization subscribe to or receive NASA technical reports?

82.9	yes	5.5	no	11.5	don't know	n = 381

Does your institution or organization subscribe to or receive such NASA announcement media and abstracting tools as Scientific and Technical Aerospace Reports (STAR) and International Aerospace Abstracts (IAA)?

STAR	60.4	yes	12.1	no	27.6	don't know	n = 381
IAA	44.1	yes	15.5	no	40.4	don't know	n = 381

Nearly 83 percent of the respondents indicated that their institution or organization subscribed to or received NASA technical reports. Sixty and 44 percent, respectively, indicated that their institution or organization subscribed to STAR and IAA. Approximately 28 and 40 percent, respectively, did not know if their institution or organization received STAR and IAA.

Several respondents to the open-ended questions indicated that STAR and IAA were not cost effective for a small R&D organization. Receipt of the questionnaire prompted several recipients to check their library or information center to ascertain receipt of STAR and IAA.

Familiarity With and Use of Selected NASA STI Publications and Services. A four part question was used to determine familiarity with and use of selected NASA STI publications and services. The results were summarized and are presented in Table B.

TABLE B

Summary: Familiarity With and Use of Selected NASA STI Products and Services

PERCENTAGES

For my research, I use: (check appropriate boxes)	Always	Usually	Sometimes	Never	Unfamiliar with - N/A = no answer
a. STAR (Scientific and Technical Aerospace Reports), the NASA announcement journal for report literature	11.5	18.6	35.2	7.9	26.8 n = 381
b. IAA (International Aerospace Abstract), the NASA announcement journal for periodicals, meeting papers, and conference proceedings	5.0	10.0	32.8	10.5	41.7 n = 381
c. SCAN (Selected Current Aerospace Notices), a NASA current awareness publication	4.5	8.4	18.6	14.7	53.8 n = 381
d. NASA literature searches obtained through the NASA Scientific and Technical Information Facility, NASA libraries, Defense Technical Information Center, or Department of Energy	6.0	11.0	34.9	18.9	29.1 n = 381
e. NASA SP-7037 "Aeronautical Engineering Continuing Bibliography"	1.6	4.2	10.8	19.9	63.5 n = 381

Approximately 12 percent of the respondents "always" used STAR, while approximately 54 percent "usually" or "sometimes" used STAR. Approximately 35 percent of the respondents "never" used or were "unfamiliar with" STAR. Approximately 5 percent of the respondents "always" used IAA, while 43 percent of the respondents "usually" or "sometimes" used IAA. Approximately 42 percent of the respondents were "unfamiliar with" IAA. Approximately 6 percent of the respondents "always" used NASA literature searches, while approximately 46 percent "usually" or "sometimes" used NASA literature searches. "Unfamiliar with" responses, 64 and 54 percent, respectively, were recorded for NASA SP-7037 and SCAN.

Several respondents indicated reliance upon their library or information center for the gathering of research information. Consequently, they had no way of knowing which, if any, NASA STI publication or service had been used. Several respondents commented that the selected STI publications, particularly the Continuing Bibliographies, should be better publicized. Some respondents reported difficulty in obtaining their organization's copy of STAR. Some respondents stated that STAR was a valuable tool, while others indicated that STAR was too voluminous to use efficiently.

Survey Topic 2: Assess the Importance of NASA STI and Langley-Authored (Published) STI in Terms of "Advancing the State-of-the-Art"

Academic and industrial personnel were asked to respond to three questions which pertained to the importance of NASA and Langley-authored (published) STI in terms of "advancing the state-of-the-art." The results were summarized and are presented in Table C.

TABLE C

Summary: Importance of NASA STI and Langley-Authored (Published) STI

PERCENTAGES

		VERY	SOMEWHAT	NEITHER	SOMEWHAT	VERY	
For my research, NASA scientific and technical information is	important	☐	☐	☐	☐	☐	unimportant
		43.6	28.6	14.7	5.5	3.7	
		3.9 N/A (no answer)					n = 381
In terms of "advancing the state-of-the-art," NASA scientific and technical information is	important	☐	☐	☐	☐	☐	unimportant
		43.0	37.0	11.3	2.6	1.8	
		4.2 N/A (no answer)					n = 365
In terms of "advancing the state-of-the-art," Langley-authored scientific and technical information is	important	☐	☐	☐	☐	☐	unimportant
		22.8	32.5	26.8	2.6	1.0	
		14.2 not familiar with those from Langley					n = 381

Approximately 72 percent of the respondents indicated that NASA STI was "very" or "somewhat" important for their research. Approximately 80 percent indicated that NASA STI was "very" or "somewhat" important for "advancing the state-of-the art." Nearly 56 percent of the respondents perceived Langley STI as being "very" or "somewhat" important for "advancing the state-of-the-art."

Several respondents to the open-ended questions commented that all NASA centers conducted high quality research and produced high quality research publications. Several respondents suggested that additional publicity for the research publications and services was essential.

Survey Topic 3: Determine the Frequency of Ordering and the Relative Speed of Delivery for NASA Technical Publications

Academic and industrial personnel were asked to respond to two questions concerning the ordering and delivery of NASA technical publications. The responses were summarized and are presented in Table D.

TABLE D

Summary: Ordering Frequency and Speed of Delivery For NASA Technical Publications

PERCENTAGES

		VERY	SOMEWHAT	NEITHER	SOMEWHAT	VERY	
For my research, NASA technical reports are ordered:	frequently	☐	☐	☐	☐	☐	infrequently
		16.0	25.2	25.2	10.0	10.5	
			13.1 not ordered				n = 381
NASA technical reports, when ordered, arrive:	quickly	☐	☐	☐	☐	☐	slowly
		9.2	25.2	31.1	7.1	5.0	
			0.0 do not arrive				
			22.3 not applicable				n = 296

Forty-one percent of the respondents indicated that they ordered NASA technical reports "very" or "somewhat" frequently, while 35 percent indicated that the reports arrived "very" or "somewhat" quickly.

A small number of open-ended responses indicated that the response time for ordering technical reports ranged from 3-6 weeks. One respondent indicated that the receipt of STAR microfiche required 8 weeks.

Survey Topic 4: Determine the Use of Non-NASA, NASA-Authored, and Langley-Authored (Published) STI

Respondents were asked three questions designed to elicit their use of published scientific and technical information (STI). The responses were summarized and are presented in Table E.

TABLE E

Summary: Use of STI

PERCENTAGES

Do you use non-NASA published literature in your research?					
a. Technical report literature	95.3 yes	2.4 no	2.4 N/A (No answer)		n = 372
b. Journal articles	96.9 yes	1.8 no	1.3 N/A		n = 376
c. Conference/meeting papers	96.1 yes	2.4 no	1.6 N/A		n = 377
Do you use NASA-authored published literature in your research?					
a. Technical report literature	86.1 yes	8.4 no	5.5 not sure		n = 381
b. Journal articles	84.4 yes	9.4 no	5.8 not sure		n = 381
c. Conference/meeting papers	85.8 yes	7.9 no	6.3 not sure		n = 381
Do you use literature published by the Langley Research Center in your research?					
a. Technical report literature	75.1 yes	13.1 no	11.8 not sure		n = 381
b. Journal articles	71.9 yes	13.1 no	15.0 not sure		n = 381
c. Conference/meeting papers	74.3 yes	12.3 no	13.4 not sure		n = 381

Approximately 96 percent of the respondents indicated that they used non-NASA published literature in their research, and 85 percent indicated that they used NASA-authored published literature. Overall, 73 percent indicated that they used Langley published research literature. However, approximately 13 percent could not distinguish LaRC from other NASA-authored published literature.

Several respondents to the open-ended questions stated a preference for the use of journal literature for disseminating and gathering research informa-

tion. Some respondents considered the technical report an important medium for presenting complete research information.

Survey Topic 5: Perceived Image of Langley-Authored Scientific and Technical Information

Respondents were asked five questions concerning the perceived image of Langley-authored STI. The responses were summarized and are presented in Table F.

TABLE F

Summary: Image of Langley STI

PERCENTAGES

		VERY	SOMEWHAT	NEITHER	SOMEWHAT	VERY	
When compared to other journal articles in my discipline, the PRESTIGE of Langley-authored journal articles is	higher	☐	☐	☐	☐	☐	lower
		9.2	26.0	41.7	3.9	1.0	
		18.1 not familiar with those from Langley					n = 381
When compared to other technical report literature in my discipline, the PRESTIGE of Langley-authored technical reports is	higher	☐	☐	☐	☐	☐	lower
		11.0	30.4	36.0	4.2	0.8	
		17.6 not familiar with those from Langley					n = 381
When compared to other technical report literature in my discipline, the ADEQUACY OF DATA in Langley-authored technical reports is	higher	☐	☐	☐	☐	☐	lower
		13.4	34.1	32.5	1.3	0.3	
		18.4 not familiar with those from Langley					n = 381
When compared to other technical report literature, the ORGANIZATION (format) of Langley-authored reports is	more readable	☐	☐	☐	☐	☐	less readable
		13.6	33.9	32.3	2.4	0.3	
		17.6 not familiar with those from Langley					n = 381
When compared to other technical report literature, the QUALITY OF VISUAL PRESENTATIONS in Langley-authored technical reports (e.g., graphics, photography, type style) is	higher	☐	☐	☐	☐	☐	lower
		16.5	33.1	29.1	3.1	0.5	
		17.6 not familiar with those from Langley					n = 381

Thirty-five percent of the respondents indicated that the prestige of Langley-authored journal articles was "very" or "somewhat" high when compared to other journal articles in their discipline. Sixteen respondents to the open-ended questions indicated that journal publications were their preferred medium for obtaining STI. Seven respondents encouraged Langley to make greater use of journal publications. Four respondents desired a publication listing recent Langley-authored journal articles.

Approximately 41 percent of the respondents indicated that the prestige of Langley-authored technical reports was "very" or "somewhat" high when compared to other technical report literature in their discipline. Four respondents to the open-ended questions cited the importance of technical reports in publishing major results and complete details. Three respondents indicated that a recent decline in the technical quality of Langley STI had occurred in their disciplines. Three respondents indicated that varying levels of prestige existed for various technical areas at Langley and, therefore, they found it difficult to generalize for the STI output of Langley.

Forty-seven percent of the respondents indicated that the adequacy of data was "very" or "somewhat" higher in Langley-authored technical reports than other technical literature in their discipline. Concerning the adequacy of data, three respondents favored an increase in the publication of negative results. Three suggested that the reports should contain a greater depth of data analysis. Two respondents proposed that additional tabular data be provided in a separate report or microfiche.

Forty-seven percent of the respondents indicated that the organization (format) of Langley-authored technical reports was "very" or "somewhat" higher than other technical report literature in their discipline. Four respondents to the open-ended questions indicated that the text and graphical material should be integrated within the report. Two respondents indicated a need for modernization of the format of the technical report. Three respondents indicated that the amount of narrative made the extraction of information difficult and two suggested simpler forms of reports.

Approximately 50 percent of the respondents indicated that the quality of visual presentations in Langley-authored technical reports was "very" or "somewhat" higher than other technical report literature in their discipline. Two

respondents desired the use of fine rather than coarse grids. Three respondents indicated that the sketches and figures were too small to detect nuance within the data.

Survey Topic 6: Demographic Information

The final set of questions, 17-25 on the survey instrument, was used to elicit demographic information concerning the respondents. The responses to each question were tabulated and reported separately.

Work Experience. Respondents were asked to indicate their number of years of professional work experience. The responses were tabulated and are presented in Table G.

TABLE G

Summary: Years of Professional Work Experience

Percentage	Years
0.0	Less than one year
2.9	1-5
7.9	6-10
22.1	11-15
21.3	16-20
45.8	21 +
100.0	n = 380

Eleven percent of the respondents had worked professionally for less than 11 years. Twenty-two percent of the respondents had between 11 and 15 years of professional work experience. Sixty-seven percent of the respondents had worked professionally 16 or more years.

Organization Type. The respondents were identified by organization affiliation. The responses were tabulated and are shown in Table H.

TABLE H

Summary: Type of Organization

Percentage	Type Organization
67.2	Industrial Organization
3.7	Not-for-profit Organization
28.1	Educational Institution
1.0	Government Agency
100.0	n = 381

Sixty-seven percent of the respondents were associated with industry, while 28 percent were associated with educational institutions. The remaining 5 percent were associated with not-for-profit organizations and government agencies.

Professional Duties. The respondents were asked to indicate their professional duties. The choices included basic/applied research, teaching/academic, and private consultant/technical administration. The results were tabulated and are shown in Table I.

TABLE I

Summary: Present Professional Duties

Percentage	Professional Duties
51.8	Basic/Applied research
23.5	Teaching/Academic (may include research)
24.7	Private consultant/Technical administration
100.0	n = 380

Approximately 52 percent of the respondents indicated basic/applied research as their professional duties. The remaining 48 percent were divided nearly equally between teaching/academic (may include research) and private consultant/technical administrative duties.

Major Field. Respondents were asked to specify their major field of interest. The five category choices included aeronautics/astronautics, chemistry and materials/physics, math and computer science, geosciences/life sciences/space sciences, and engineering only. The results were tabulated and are shown in Table J.

TABLE J

Summary: Major Field of Interest

Percentage	Professional Field
40.3	Aeronautics/Astronautics
7.2	Chemistry and Materials/Physics
12.2	Math and Computer Science
8.5	Geosciences/Life Sciences/Space Sciences
31.8	Engineering only
100.0	n = 377

Forty percent of the respondents identified aeronautics/astronautics as their major field of interest. Seven percent identified chemistry and materials/physics. Twelve percent identified math and computer science, while approximately 9 percent identified geoscience/life sciences/space sciences. Nearly 32 percent identifed engineering as their major field of interest.

Publishing. Questions 21-23 respectively were concerned with the importance of publishing, management support of publishing, and whether the respondents had published. The results were tabulated and are shown in Table K.

TABLE K

Summary: Advancement Through Publication, Publication Support, and Publication Experience

PERCENTAGES

		VERY	SOMEWHAT	NEITHER	SOMEWHAT	VERY	
In terms of my professional advancement/ development, publishing is:	important	☐	☐	☐	☐	☐	unimportant
		40.4	25.7	16.3	12.1	5.5	n = 381
Regarding publication, my management is:	supportive	☐	☐	☐	☐	☐	nonsupportive
		45.3	29.2	18.9	5.3	1.3	n = 380

Do you publish?	Percentage
Do publish	92.8
Do not publish	7.2
	100.0

n = 376

Nearly all of the respondents published, while approximately 67 percent indicated that publishing was "very" or "somewhat" important to their careers. Approximately 75 percent of the respondents indicated that management was "very" or "somewhat" supportive regarding publication.

Non-NASA Technical and Professional Conference. The respondents were asked how many technical/professional conferences (e.g., workshops, symposia, meetings) other than NASA conferences they had attended within the past three years. The results were tabulated and are shown in Table L.

TABLE L

Summary: Attendance at Non-NASA Conferences

Number of Conferences	Number of Respondents	Percent
None	16	4.2
One	14	3.7
Two	36	9.4
Three	52	13.6
Four	22	5.8
Five	36	9.4
Six	48	12.6
Seven	13	3.4
Eight	24	6.3
Nine or more	120	31.6
Total	381	100.0%

Nearly 32 percent of the respondents had attended nine or more conferences within the last three years. Approximately 68 percent of the respondents had attended between one and eight conferences. Nearly 51 percent of the respondents had attended between two and six conferences within the past three years.

TABLE M

Summary: Attendance at NASA Conferences

Number of Conferences	Number of Respondents	Percent
None	78	20.5
One	90	23.6
Two	95	24.9
Three	58	15.3
Four	15	3.9
Five	15	3.9
Six	13	3.5
Seven	4	1.0
Eight	1	0.3
Nine or more	2	3.1
Total	381	100.0%

Nearly 64 percent of the respondents had attended between one and three

NASA conferences during the past three years. Twenty percent had not attended a NASA conference during the past three years.

Survey Topic 7: Identify Ways in Which NASA and Langley-Generated STI Could Be Made More Accessible to Non-NASA Engineers and Scientists

A total of 128 open-ended responses addressed some aspect of accessibility of NASA and Langley-generated STI. These responses were analyzed and are presented by topic.

A total of eighty responses to the open-ended questions focused on the Agency's publication, announcement, and dissemination practices. Nineteen respondents indicated that NASA should educate users and potential users about the range of NASA publications and how to obtain them. Seven respondents suggested that NASA advertise subject-specific research publications in appropriate open-literature journals and periodicals. Four respondents suggested that NASA advertise the announcement journals, STAR and IAA, in the open literature. Four respondents commented that a lowered perception of the quality of NASA publications resulted from their lack of visibility. Ten respondents suggested additional ways to announce NASA's published research.

Five of these individuals recommended that all recent publications should be listed in newsletters on a monthly or quarterly basis, possibly with brief reviews and subject indexing. Five individuals preferred that NASA produce subject-specific newsletters or reviews. Concerning dissemination of all announcements of published research, 14 respondents indicated that the mailing should be directed at interested individuals as well as organizations.

Seven respondents commented on the long delay between the conduct of research and the publication or announcement of the report. Five individuals expressed dissatisfaction with the delivery time for reports.

At both Agency and Langley levels, seven individuals desired information about work in progress, including a contact for obtaining further information. Four respondents suggested that this preliminary information was preferable to the long wait for published information about completed research. Four respondents desired information about planned projects.

Six respondents commented on difficulties concerning Contractor Reports (CR's). The responses indicated that CR's were not uniformly clear and factual, that the publication process took too long, and that it was difficult to obtain copies of the reports.

Four respondents, who identified themselves as taxpayers and/or contractor/grantees, desired to obtain free copies of publications important to their research.

There were 24 responses directly concerned with the accessibility of Langley STI either through the use of Langley-authored publications or through personal contact. Ten respondents stressed the importance of personal contact and expressed their satisfaction with the accessibility of Langley personnel. Six respondents commented that they had obtained copies of reports from the author when they needed the information quickly. Ten respondents suggested that additional ways of announcing Langley STI should be employed on a monthly or quarterly basis and be directed at individual researchers. Six of these respondents indicated that each publication be limited to a specific subject category. Four respondents wanted the publication to announce all current Langley STI. Three respondents desired that a source for further information be identified for information on ordering or obtaining Langley reports.

FINDINGS

The findings were summarized and are presented for each survey topic. The following descriptors were used to present the findings:

Plurality	- the largest group, but less than half of the respondents
Substantial Minority	- an opposing response of 25% or more
Majority	- 50 to 59% of the respondents
Clear Majority	- 60 to 69% of the respondents
Strong Majority	- 70 to 79% of the respondents
Overwhelming Majority	- 80% or more of the respondents

Survey Topic 1: Assess the Familiarity With and Use of Selected NASA STI Publications and Services

An overwhelming majority of the respondents indicated that their organization/institution subscribed to or received NASA technical reports. A clear majority indicated that their organization/institution subscribed to or received STAR, while a substantial minority did not know whether their organi-

zation subscribed to or received STAR. A plurality indicated that their organization/institution subscribed to IAA, while a slightly smaller percentage did not know whether their organization/institution subscribed to or received IAA.

A majority of the respondents "usually" or "sometimes" used STAR. A substantial minority were "unfamiliar with" STAR or did not respond.

A plurality of the respondents "usually" or "sometimes" used IAA. A slightly smaller percentage were unfamiliar with IAA or did not respond.

A clear majority of the respondents were unfamiliar with SP-7037. Twenty percent of the respondents indicated that they never used SP-7037.

Responses to the open-ended questions indicated that several respondents were not sure which NASA publications or services had been used by their organization's library to supply the information they used. Some respondents commented that STAR was valuable for their research, while others either had difficulty obtaining the organization's copy or found STAR too voluminous to use efficiently.

Survey Topic 2: Assess the Importance of NASA STI and Langley-Authored (Published) STI in Terms of "Advancing the State-of-the-Art"

A strong majority of the respondents indicated that NASA STI was important for their research. An overwhelming majority indicated that NASA STI was important in "advancing the state-of-the-art." A strong majority indicated that Langley-authored STI was important in "advancing the state-of-the-art."

Survey Topic 3: Determine the Frequency of Ordering and the Relative Speed of Delivery for NASA Technical Publications

A plurality of the respondents indicated that NASA technical reports were ordered frequently. A substantial minority indicated that NASA technical reports were ordered "neither frequently nor infrequently." A plurality indicated that NASA technical reports arrived "neither quickly nor slowly."

Survey Topic 4: Determine the Use of Non-NASA, NASA-Authored, and Langley-Authored (Published) STI

An overwhelming majority of the respondents indicated that they used non-NASA published literature in their research. An overwhelming majority indicated that they used NASA-authored published literature in their research. A strong majority indicated that they used literature published by the Langley Research Center in their research.

Survey Topic 5: Perceived Image of Langley-Authored Scientific and Technical Information

A plurality of the respondents indicated that the prestige of Langley-authored journal articles was "neither higher nor lower" than other journal articles in their disciplines. A substantial minority indicated that the prestige of the Langley-authored journal articles was high compared to other journal articles in their disciplines. Sixteen of the respondents to the open-ended questions indicated that they preferred journal publications to report literature as a source of technical information.

A plurality of the respondents indicated that the prestige of Langley-authored technical reports was high compared to other technical report literature in their disciplines. A substantial minority indicated that the prestige of Langley-authored technical reports was "neither higher nor lower" compared to other technical report literature in their disciplines.

A plurality of the respondents indicated that the adequacy of data in Langley-authored technical reports was high compared to other technical report literature. A substantial minority indicated that the adequacy of data in Langley-authored technical reports was "neither higher nor lower" than other technical report literature.

A plurality of the respondents indicated that the organization (format) of Langley-authored reports was more readable than other technical report literature. A substantial minority indicated that the organization of Langley-authored reports was "neither more nor less readable" compared to other technical report literature.

A majority of the respondents indicated that the quality of visual presentations in Langley-authored reports was high compared to other technical report literature. A substantial minority indicated that the quality of visual presentations of Langley-authored reports was "neither higher nor lower" than other technical report literature.

Survey Topic 6: Demographic Information

An overwhelming majority of the respondents had more than 11 years professional work experience. A plurality had worked professionally more than 21 years.

A clear majority were employed by an industrial organization and a substantial minority were employed within the educational profession.

A majority of the respondents were engaged in basic or applied research. A smaller group of respondents were engaged in private consultant or technical/administration duties. The smallest group of respondents were engaged in teaching or academic duties which may have included research.

A plurality of the respondents indicated that aeronautics/astronautics was their major field of interest. A substantial minority identified engineering as their major field of interest.

A clear majority of the respondents indicated that publishing was important for their advancement/development. A clear majority indicated that management was supportive regarding publication. Responses to item 23 had to be re-categorized into those who published and those who did not publish. An overwhelming majority of the respondents indicated that they published.

A clear majority of respondents indicated that they had attended one to eight non-NASA conferences (workshops, symposia, meetings) within the last three years. A clear majority of the respondents indicated that they had attended one to three NASA conferences within the last three years.

Survey Topic 7: Identify Ways in Which NASA and Langley-Generated STI Could be Made More Accessible to Non-NASA Engineers and Scientists

Survey topic 7 was an open-ended question concerning the accessibility of NASA and Langley STI. The 128 responses covered numerous aspects of accessibility. Use of the descriptors "plurality," "majority," etc., were therefore not used to present the findings for this topic.

- o Increase visibility of STAR and IAA

  Respondents suggested that the announcement journals STAR and IAA be advertised in the open literature journals.

- o Develop additional announcement techniques

  Respondents suggested that additional ways of informing users about NASA and Langley published research be developed.

- o Identify authors and STI contacts

  Respondents suggested that the names of author(s) or contact(s) be included with all announcements of completed, in-progress, or planned research.

- o Identify work in progress and planned research

Respondents suggested that information concerning on-going and planned research be published to aid in planning and supporting their own efforts.

- o Educate users and potential users

Respondents suggested that more information about ordering NASA and Langley reports be provided.

- o Include interested users in all announcements

Respondents suggested that individuals as well as organizations be included in all NASA and Langley STI announcements

- o Publish both general and specific announcements

Respondents suggested that two types of announcements be used, one which included all subject categories and one which was subject-specific.

- o Speed up distribution of reports

Respondents commented that the delivery time for reports on automatic distribution and ordered reports was sometimes too long.

CONCLUSIONS AND RECOMMENDATIONS

The analysis of the data revealed that NASA STI was important to the research conducted by the majority of the respondents and that the majority of respondents viewed NASA STI as important in terms of "advancing the state-of-the art." NASA and Langley STI was used by 85 and 74 percent, respectively, of the respondents. NASA and Langley-authored technical reports, journal articles, and conference/meeting papers were used equally by a strong majority of the respondents. The analysis of the responses indicated a significant lack of familiarity with and lack of use of selected NASA STI products and services. This is in direct contrast to the number (83 percent) of respondents who indicated that their organizations subscribed to or received NASA technical reports.

The responses to the closed-ended and open-ended questions were used to establish a perspective for the survey topics. These responses were analyzed to form conclusions which are presented for each survey topic. Recommendations were made based on the conclusions and are presented for each survey topic.

Survey Topic 1: Assess the Familiarity With and Use of Selected NASA STI Publications and Services

While NASA technical reports were subscribed to or received by the majority of respondents, the respondents were unfamiliar with STAR, IAA, SCAN, RECON, and

NASA SP-7037 (27, 42, 54, 30, and 64 percent, respectively). With the underlying assumption that increased use would result from increased familiarity, the processes used by the NASA STI system to familiarize academic and industrial engineers and scientists with NASA STI products and services should be reviewed.

Recommendation: A study to determine how NASA STI products and services are publicized and announced should be undertaken. Particular emphasis should be placed on how NASA informs users and potential users about the STI products and services.

Recommendation: A study of the current NASA dissemination program, which uses librarians and information specialists as gatekeepers, should be undertaken to determine how NASA products and services are publicized within affiliated organizations. Monge (1979) reported that newsletters prepared by corporate librarians and information specialists were the most frequent ways in which engineers and scientists learned about NASA publications. A study of the current dissemination program should focus on making the system more effective in terms of reaching the user.

Recommendation: A study to determine how the utility or use of NASA STI products and services could be increased should be undertaken. In-depth interviews and questionnaires should be included in the study. Particular emphasis should be placed on existing products and services with the idea of modifying them or creating new ones.

Survey Topic 2: Assess the Importance of NASA STI and Langley-Authored (Published) STI in Terms of "Advancing the State-of-the-Art"

An overwhelming majority of the respondents considered NASA STI important for "advancing the state-of-the-art" and a strong majority considered NASA STI important for their own research. While 75 percent of the respondents used Langley-authored (published) literature, only 55 percent considered it important in "advancing the state-of-the-art."

Recommendation: Based on a survey of aeronautical organizations, Monge (1979) recommended that NASA produce more publications on the "state-of-the-art" in major research areas. Since Langley is so heavily oriented toward aeronautics, Langley authors should be encouraged to prepare more "state-of-the-art" publications. These could be prepared as NASA reports, journal articles, and meeting/conference papers.

Recommendation: Approximately 40 percent of the survey population identified aeronautics/astronautics as their major field of interest, yet 64 percent were "unfamiliar with" NASA SP-7037 (Aeronautical Engineering Continuing Bibliography). Special attention should be given to increasing the scope of this series of reports and increasing the awareness of their existence among users and potential users of NASA STI.

Survey Topic 3: Determine the Frequency of Ordering and the Relative Speed of Delivery for NASA Technical Publications

A plurality of the respondents had ordered NASA technical reports for their own research and indicated that the reports arrived quickly. Nearly 24 percent of the respondents either didn't order NASA reports or ordered them very infrequently.

Some respondents to the open-ended questions, however, commented that there was a long delay in the receipt of reports. None of the respondents reported the lack of receipt of ordered reports. This is contrary to the findings of Monge (1979) who reported that 20 percent of the STAR reports ordered by respondents never arrived.

Recommendation: As part of a study of the NASA dissemination program, questions on ordering of reports should be included in the personal interviews and questionnaires. This would provide information to resolve the apparent difference between the findings of the two studies.

Survey Topic 4: Determine the Use of Non-NASA, NASA-Authored, and Langley-Authored (Published) STI

An overwhelming majority (85 percent) of the respondents used non-NASA and NASA-authored literature in their research. A strong majority (74 percent) used literature published by the Langley Research Center in their research. All three media (technical reports, journal articles, and conference/meeting papers) were equally well used.

Conference/meeting papers were used by 96 percent of the academic and industrial engineers and scientists surveyed. The Langley Research Center continues to make a concerted effort to document (publish) conference/meeting papers. When Langley is a sponsor or a co-sponsor, efforts are made to publish the proceedings of a conference as a NASA Conference Publication (CP). Recent changes by the NASA Scientific and Technical Information Branch (STIB) have

substantially increased the distribution of NASA CP's. However, papers appearing in NASA CP's are not accessioned and announced individually, a practice employed by other STI systems within the federal government.

Recommendation: Under the guidance and direction of Headquarters' Scientific and Technical Information Branch, NASA should encourage documentation (publishing) of NASA-authored conference/meeting papers and should consider the indexing and announcement of individual conference/meeting papers.

Recommendation: The Research Information Applications Division (RIAD) at Langley, with support from Center management, should encourage the documentation of conferences and meetings, in particular, the research output which is reported in the annual STI output book as unpublished research. Continuing efforts should be made to document (publish) the proceedings of Langley sponsored and co-sponsored conferences, meetings, and workshops.

Survey Topic 5: Perceived Image of Langley-Authored Scientific and Technical Information (STI)

Four questions were included in the survey of academic and industrial engineers and scientists (the external group) to establish the perceived image of Langley-authored STI. These questions were similiar to the four questions covering the same topic in the survey of Langley research personnel (the internal group). Conclusions were drawn for each of these questions based on a comparison of the data derived from the two surveys.

Langley research personnel were more positive in their rating of the prestige of Langley-authored STI than were the external group. The prestige of Langley-authored journal articles was rated considerably higher by the internal group (70 percent) than by the external group (35 percent). The prestige of Langley-authored technical reports was rated more closely by the internal group (56 percent) and the external group (41 percent). However, a perception of low prestige for the Langley-authored technical report was indicated more frequently by the internal group (25 percent) than by the external group (5 percent). Overall, the internal group attributed higher prestige to Langley-authored journal articles than did the external group and lower prestige to Langley-authored technical reports than did the external group.

The adequacy of data in Langley-authored technical reports was rated higher by the internal group (73 percent) than by the external group (48 percent).

Neither the internal or external groups indicated that the adequacy of data in Langley-authored technical reports was low. Monge (1979) reported that insufficient data was a major inadequacy of NASA reports. The results of the internal and external surveys did not confirm Monge's findings.

The internal group was more positive (78 percent) than was the external group (48 percent) in the opinion that the organization of Langley-authored technical reports made them more readable. Neither group reported that the organization (format) of Langley-authored technical reports made them less readable. Monge (1979) reported that the organization (format) of NASA reports made them less readable and suggested that NASA prepare general guides for technical report preparation.

Recommendation: Although NASA has publication guides which are contained in NASA SP-7013, it is quite possible that not all centers are adhering to the established format. A study should be undertaken by NASA Headquarters, STIB to ascertain the extent to which technical reports produced by the various centers conform to established NASA publication guidelines.

Recommendation: The review of related literature produced little empirical research relative to the use of technical reports by engineers and scientists. As part of the follow-on activities for the Langley STI review and evaluation project, a study should be undertaken to determine the usage of technical report components and establish the most effective organization and sequence.

The question concerning the quality of visual presentation of Langley-authored technical reports was asked only of the external group. Approximately 50 percent of the respondents indicated that the quality of visual presentation in Langley-authored technical reports was higher when compared to other technical report literature. At present, approximately 80% of all reports on automatic distribution are on microfiche. This practice necessitates high levels of legibility. Monge (1979) reported that executives and researchers had many criticisms of the graphs, type size, and type style used in NASA technical reports. Monge suggested that standards for legibility were essential, considering the average age of his survey population (47 years of age with 21.5 years of professional experience). The age and years of professional work experience of Monge's population were highly similar to those of the internal and external groups.

Recommendation: Although the findings of Monge were not confirmed by the responses of either the internal or external groups, it is possible that the

quality of visual presentation in NASA technical reports may not be uniformly high. A review of the visual standards employed as part of the NASA publication standards for technical reports should be conducted. Where possible, the existing standards should be compared with standards existing elsewhere. Where no standards are prescribed in the NASA publication program, they should be developed and promulgated.

Survey Topic 6: Demographic Information

The demographic information for the external group closely paralleled that of the internal group in terms of age and years of professional work experience. Like the internal group, the external group indicated that publishing was important to advancement and that their management was supportive of publishing.

As with the internal group, the overwhelming majority of the external group published. The major fields of interest of the external group by STAR category closely paralleled the research output of the internal group.

A clear majority of the external group indicated that they had attended between one and three NASA conferences within the past three years. In terms of attendance at non-NASA conferences, the external group, on the average, attended three times as many conferences (workshops, symposiums, and meetings) than did the internal group.

Recommendation: Despite the continuing reduction in travel dollars, some attempt should be made to facilitate greater attendance by Langley research personnel at non-NASA conferences.

Survey Topic 7: Identify Ways in Which NASA and Langley-Generated STI Could Be Made More Accessible to Non-NASA Engineers and Scientists

This topic was an open-ended question concerning the accessibility of NASA and Langley STI. The 128 responses covered numerous aspects of accessibility. Much of the information desired by the external group is presently provided by the NASA STI system. Names of authors are provided in all announced STI. On-going research and planned research are announced in STAR. The publication SCAN, which is available to the external group, provides individual access to information by specific area(s) of interest. In addition to the RTOP's (Research and Technology Operating Plan) published in STAR, each NASA Center publishes an annual Research and Technology Report which gives highlights of research being conducted.

Recommendation: A program should be undertaken by Headquarters STIB to make the research community aware of the products and services offered through the NASA Information System. This program should focus on the librarians and information specialists who serve as gatekeepers within the current distributive system and the individual engineers and scientists who are users and potential users of the NASA STI system. Promotional materials should be developed and distributed using the mailing lists for technical organizations and societies. Articles in the open literature and presentations should be used by STIB personnel to promote awareness. The awareness program must include both internal and external users. PROFILES should be updated and distributed to NASA research personnel through workshops at the Centers. Feedback should be continually sought from internal and external users which would be used to plan and update STI products and services.

Much of the information desired by academic and industrial respondents concerning Langley-authored and -sponsored STI is currently available in the annual STI output book. The 1980 edition contained several new features designed to enhance the usefulness of the output book. The categories were expanded to include Computer Programs registered with COSMIC, Tech Briefs, and Patents. In addition, the output book contained an author, subject category, RTOP, and Tech Brief index. Emphasis was placed on archival or "published" research. Particular care was taken to provide complete citations including source of availability. Complete journal citations and the availability of conference/meeting papers were provided.

The distribution of the output book was significantly increased this year. The output book was published as a NASA Technical Memorandum (TM). This means that the report was accessioned into the NASA STI data base, announced in STAR, and made available for public sale through NTIS. Copies of the output book were distributed to academic, industrial, and government libraries. Each STI coordinator provided names and addresses of individuals to receive copies of the output book. Members of certain NASA advisory committees received a copy of the output book. Approximately 2,200 copies were distributed.

Recommendation: The new features present in the 1980 output book should be included in future editions. Each STI coordinator should encourage the

research personnel within his/her division to continue to submit the names of interested individuals to receive copies of the output book.

The agency's automatic distribution system for technical publications is organizational in nature. These reports are distributed to institutions and organizations, not individuals. To foster a more timely dissemination of information to the individual users and to promote greater exchange of STI between scientists, Langley research personnel are provided author copies of their reports for scientist-to-scientist exchange.

Recommendation: Langley Research Center should strive to develop a secondary distribution program for Langley-authored formal series technical publications. This program could be inaugurated by RIAD with the help of the STI coordinators and should include the compiling of a computerized mailing list containing the names of engineers and scientists in industry, academia, and government who are conducting similar research. Finally, consideration might be given by RIAD to increasing the number of author copies of Langley-authored formal series technical publications to the extent permitted by federal law and Agency regulation.

REFERENCES CITED

Bellenger, Danny N., and Greenberg, Barnett A. Marketing Research: A Management Information Approach. Homewood, IL: Richard D. Irwin, Inc., 1978.

Boyd, Harper W., and others. Marketing Research: Text and Cases. Fourth Edition. Homewood, IL: Richard D. Irwin, Inc., 1977.

Burr, Richard E. NASA Scientific and Technical Information System Study. Washington, D.C.: National Aeronautics and Space Administration, 1978. Unpublished.

Debons, Anthony, and Montgomery, K. Leon. "Design and Evaluation of Information Systems." In (1974) Annual Review of Information Science and Technology. Vol. IX. Edited by Carlos A. Cuadra. Washington, D.C.: American Society for Information Science, 1974, 25-55.

Drobka, George, and others. NASA STI Programs Evaluation. Washington, D.C.: National Aeronautics and Space Administration, 1973. Unpublished.

Duberg, John. Review of Activities of STIO and STIF. Washington, D.C.: National Aeronautics and Space Administration, 1973. Unpublished.

Dewhirst, H. Dudley. The Role of the LRC Technical Library in Fulfilling the Information Needs of Professional Employees. Washington, D.C.: National Aeronautics and Space Administration, August 1970, (Avail. EDRS 066-174).

Dillman, Don A. Mail and Telephone Surveys: The Total Design Method. New York: John Wiley and Sons, 1978.

Fishbein, Martin, and Ajzen, Icek. Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. Reading, MA: Addison-Wesley, 1975.

King, Donald W., and Bryant, Edward C. The Evaluation of Information Services and Products. Washington, D.C.: Information Resources Press, 1971.

Kress, George. Marketing Research. Reston, VA: Reston Publishing Company, Inc. 1979.

Monge, Peter R., and others. The Assessment of NASA Technical Information. E. Lansing, MI: Communimetrics, Inc., 1979. Unpublished.

Pinelli, Thomas E., and others. A Review and Evaluation of the Langley Research Center's Scientific and Technical Information Program: Results of Phase 1 - Knowledge and Attitudes Survey, LaRC Research Personnel. NASA TM-81893. Washington, D.C.: National Aeronautics and Space Administration, November 1980, (Avail. NTIS 81N-16947).

Pryor, Harold E. "An Evaluation of the NASA Scientific and Technical Information System." Special Libraries, LXVI (11), November 1975, 515-519.

Pryor, Harold E. "Listening to the User." In AGARD The Problem of Optimization of User Benefits in Scientific and Technological Information Transfer. Paris, France: AGARD CP-179, March 1976, (Avail. N76-25109).

Swanson, Rowena W. "Design and Evaluation of Information Systems." In (1975) Annual Review of Information Science and Technology. Vol. X. Edited by Carlos A. Cuadra. Washington, D.C.: American Society for Information Science, 1975, 43-101.

Warwick, Donald P., and Lininger, Charles A. The Sample Survey: Theory and Practice. New York: McGraw Hill Book Company, 1975.

Wentz, Walter B. Marketing Research: Management and Methods. New York: Harper and Row Publishers, 1972.

APPENDIX A

A PROJECT PLAN FOR THE REVIEW AND EVALUATION OF THE LANGLEY RESEARCH CENTER'S SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

INTRODUCTION

One of the most important results of exploration and research and development is information. The National Aeronautics and Space Administration's scientific and technical information system is one of the largest and best known federal STI programs in the country. The mission of the NASA STI is two-fold: (1) to acquire worldwide research in aeronautics, space, and related disciplines to keep NASA personnel abreast of current activities and developments; and (2) to contribute to the expansion of STI through timely dissemination of NASA-generated and -sponsored research, development, testing, and technical evaluations. The Langley STI program is an integral part of the Agency's STI program and is responsible for implementing Agency and Center policies concerning the management of STI. Expeditious publication of the Center's research is Langley's contribution to the Agency's goal of timely dissemination of NASA research.

BACKGROUND

The Langley Research Center (LaRC) is one of the leading national laboratories for research and development in the sciences of aeronautics and space technology. Founded in 1917, Langley was the nucleus of the former National Advisory Committee for Aeronautics (NACA). For more than 60 years, Langley engineers, scientists, and technicians have been conducting basic and applied research in fluid and flight mechanics, flight systems, structures and materials, acoustics and noise reduction, measurements and instrumentation systems, data systems, and space and earth sciences. The results of this research are disseminated through NASA scientific and technical publications as well as non-NASA media such as technical or professional society journals and similar periodicals; domestic and foreign presentations of papers, talks, and lectures; and in the proceedings of conferences and symposia. For calendar year 1980, Langley's 1,306 engineers and scientists produced 1127 items which included 175 NASA formal series technical publications; 136 NASA Quick-Release Technical Memorandums; 146 journal articles; 352 conference/meeting papers; 85 NASA Tech Briefs; 10 NASA computer programs; 20 patents; and 203 pieces of unpublished research. The documented research output of the Langley Research Center is processed through the Langley Research Information and Applications Division (RIAD), which is an integral part of the NASA Scientific and Technical Information system.

STATEMENT OF THE PROBLEM

During the 63-year history of the Langley Research Center, a comprehensive review and evaluation of the Center's STI program has never been conducted.

APPENDIX A

Portions of the Center's STI program have received periodic or occasional assessment; however, no valid empirical data exist which can be used to evaluate the total program's efficiency and effectiveness.

PURPOSE OF THE PROJECT

A comprehensive review/evaluation of the Center's STI program will seek to determine the extent to which the program is meeting the needs of Langley research and professional personnel and the recipients of Langley-generated scientific and technical information, the areas or portions of the program which need improvement, and ways in which the program can be modified to improve its overall efficiency and effectiveness. In conjunction with the evaluation project, a theoretical and analytical review of the NASA formal report as a medium for information transmittal will be conducted. The results of the project may enable NASA to develop a more effective medium for transmitting the results of its research.

Objectives for the Project

Ten objectives were established for the project. These objectives were to

1. Assess the knowledge of and attitudes toward the Langley STI Program;

2. Assess the knowledge of and attitudes toward NASA and Langley STI;

3. Determine the information needs of Langley and NASA STI users;

4. Establish the perceived usability, technical quality, and prestige of Langley STI;

5. Assess the adequacy, quality, and timeliness of research support services provided by the Langley STI program;

6. Determine the familiarity with and use of selected NASA STI products and services;

7. Determine if the dissemination of Langley STI could be made more effective;

8. Determine if the dissemination of NASA STI could be made more effective;

9. Determine the effectiveness of the Center's policies and procedures for processing/publishing Langley STI; and

10. Develop a selected, annotated bibliography on the design and evaluation of STI systems.

APPENDIX A

Overview

The project will utilise both survey research and systems analysis techniques and will be directed by Thomas E. Pinelli, Assistant Chief, RIAD. A steering committee of 17 individuals will be used to help focus, develop, and guide the project through its completion. Each research division will nominate a representative to serve on the committee. The Chief of the Scientific and Technical Information (STI) Branch, NASA Headquarters, will serve as an ex-officio member of the committee. The individual tasks established for the project will be executed using Langley, Old Dominion University, and professional contract personnel.

Limitations

The project will be limited to the scientific and technical information output of the Center as processed or disseminated through the Langley STI program. The project is not concerned with either informal transfer or secondary application of the Center's research output. The project will involve researchers at the Langley Research Center and NASA information users in other government agencies, industry, and academic institutions.

REVIEW OF RELEVANT RESEARCH

A search is underway to identify literature relevant to the project. The results of Langley and Headquarters' STI studies and assessments conducted since 1968 will be collected and used to help develop the research methodology for the project. A review of STI systems, STI models, and a review of STI evaluative activities will be undertaken.

RESEARCH METHODOLOGY

The project will investigate the effectiveness and efficiency of the Center's scientific and technical information program, with particular emphasis placed on improving the effectiveness of the dissemination process. The specific actions to be taken are described in the following phases.

Phase I: Knowledge and Attitudes Survey, Langley Research Personnel

Phase I of the review and evaluation project requires an assessment of the adequacy of the Center's STI program in meeting the needs of Langley research and professional personnel. Areas of the program which need improvement will be identified and ways in which the program can be made more effective will be recommended. This task involves (1) determining through open-ended questions during in-depth interviews the areas and dimensions of the program which researchers consider important, (2) constructing a closed-ended survey to be distributed to all research personnel, (3) tabulating and analyzing the responses to the closed-ended questions and compiling and analyzing the proposed changes and recommendations solicited by several open-ended questions

and, (4) presenting the findings of the questionnaire in a final report. The results of the survey will provide an assessment of the adequacy of the NASA Langley STI program in meeting the needs of Langley engineers and scientists both as information producers and as information users.

Phase II: Audit of Publication Process

Phase II of the review and evaluations project requires an "audit" or management analysis of the policies, procedures, and practices used by the Langley Research Center to process, publish, or otherwise handle scientific and technical information. This task involves (1) identifying the various media used by the Center to output its scientific and technical information; (2) compiling all regulations, policies, and instructions applicable to these media; (3) documenting the procedures as currently prescribed; (4) comparing current or actual practices with published management instructions to identify discrepancies or gaps in procedural guidance; and (5) recommending additional or modified procedures. The results of the analysis will establish the total current procedural framework for processing, publishing, or otherwise handling Langley's scientific information and to supplement existing practices and procedures to create a comprehensive, effective, understandable, and practical framework covering the handling of all research output.

Phase III: Audit of the Report and Manuscript Control Office (RAMCO)

Phase III of the review and evaluation project requires an audit or management analysis of the policies, procedures, and practices used by RAMCO (Report and Manuscript Control Office) to manage and report the Center's scientific and technical information output.

The audit involves (1) documenting the current manual system using flow-charts, tables, and other systems analysis tools and techniques; (2) determining whether changes to the current manual system are necessary and justifiable; (3) proposing a new manual or automated (internal or external) system with appropriate justification for selection; (4) examining the feasibility of in-house automation capabilities; and (5) presenting the procedural framework, underlying models, analysis, comments, and recommendations in a final report.

The results of the analysis will provide an analysis and documentation of the current RAMCO operations, identifying areas for potential improvement including possible automation. The audit will emphasize the records management aspect of the operation.

Phase IV: Knowledge and Attitudes Survey, Academic and Industrial Personnel

Phase IV of the review and evaluation project requires an assessment of the benefits, usage, and perceived quality of the NASA/Langley STI Program and STI output by recipients/users in industry, government, and academia. Since the Langley STI program is an integral part of the Agency's STI program, NASA

Headquarters has requested that the survey used by the consulting firm include questions pertaining to the Agency-wide STI program and output.

This task involves (1) preliminary telephone interviewing of NASA STI users to supply both content and direction for a closed-ended questionnaire, (2) constructing a closed-ended questionnaire to determine the extent to which the program is meeting the needs of industrial and academic users of NASA/Langley STI, (3) tabulating and analyzing the responses to the questionnaire, and (4) presenting the findings of the questionnaire in a final report. The results of the survey will determine the knowledge of an attitude toward NASA and Langley STI held by the external user population. The results of Phase IV will be combined with the results of the other phases of the project to evaluate the Langley STI program.

Phase V: Bibliography

Phase V of the review and evaluation project requires the development of a selected, annotated bibliography of literature citations on the topic of the design and evaluation of a scientific and technical information system. The results of Phase V will provide a theoretical understanding and base upon which the methodology of the review and evaluation project was founded.

Phase VI: The NASA Formal Report

Part I: The Scientific/Technical Report -- A Review of Its Components and Current Usage

Part I of Phase VI requires a comprehensive evaluation of the effectiveness of the scientific/technical report in transmitting STI. This task involves (1) developing criteria for the structure and use of the various report components, (2) documenting the organization and sequence of the various components within a representative sample of reports, and (3) comparing the NASA formal report to the report environment of today. The outcome or stated purpose of this evaluation will be the establishment of benchmarks by which the NASA report can be evaluated.

Part II: Quantitative and Qualitative Criteria for Evaluation (Bibliography, Index, and Tables)

Part II of the review and evaluation project requires a theoretical and analytical review of the formal report as a medium for information transmittal.

This task includes (1) obtaining, through a manual and computer search, an exhaustive bibliography of literature and (2) describing in quantitative terms the usage of report components in the report environment. The bibliography will contain (1) an index of reports produced by government, colleges, and private enterprise (acquired during prior research); (2) literature which describes the

usage of components in the scientific/technical report; and (3) literature which pertains to the evaluation of these communications elements in the scientific report.

The outcome of the review process will be the development of criteria for efficient report organization.

Part III: The NASA Formal Report -- A Review, Assessment, and Recommendations

Part III of the review and evaluation project requires an assessment of the overall report organization, the component parts of the report, and the relationship of those parts within the total report context. This task includes (1) contrasting other industry and agency reports (illustrated in prior research) with the NASA report, (2) determining which evaluative criteria can be applied to the formal evaluation and possible modification of the NASA Langley technical report format, (3) establishing a methodology for evaluating the NASA report format, (4) outlining a sequence for the component parts and spelling out what each should include, and (5) preparing and presenting a final report.

The outcome of this phase will be a suggested outline for a sequence and hierarchy of parts for specific users and a series of criteria for graphic and verbal elements.

APPENDIX A

COSTS

LaRC

Obligated for:

Phase I - Knowledge and Attitudes Survey, Langley Research Personnel
Phase II - Audit of Publication Processes
Phase III - Audit of the Report and Manuscript Control Office (RAMCO)
Phase IV - Knowledge and Attitudes Survey, Academic and Industrial Personnel
Phase V - Annotated Bibliography

Headquarters

Obligated for:

Phase VI - The NASA Formal Report

REPORTING

Each phase of the review and evaluation project will be documented. The results of the internal and external surveys will be published as NASA Quick-Release Technical Memorandums. The selected, annotated bibliography on the design and evaluation of STI systems will be published as a NASA Quick-Release Technical Memorandum. A report to management will be prepared for each phase of the review and evaluation project. The results of the review and evaluation project will be documented in a summary report.

SCHEDULES - PHASES

Phase/Title	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Phase I Knowledge and Attitude Survey, Langley Research Personnel			⊢	—	—	—	—	⊣				
Phase II Systems Analysis: Audit of Publication Process				⊢	—	—	—	—	—	⊣		
Phase III Systems Analysis: Audit of the Report and Manuscript Control Office (RRMCO)									⊢	—	—	⊣
Phase IV Knowledge and Attitude Survey, Industrial and Academic Personnel										⊢	—	⊣
Phase V Annotated Bibliography	⊢	—	—	—	—	—	—	—	—	—	—	⊣
Phase VI The NASA Formal Report								⊢	—	—	—	⊣
Part I: The Scientific/Technical Report — A Review of Its Components and Current Usage								⊢	—	⊣		
Part II: Quantitative and Qualitative Criteria for Evaluation (Bibliography, Index, and Tables)									⊢	—	⊣	
Part III: The NASA Formal Report — A Review, Assessment, and Recommendations									⊢	—	—	⊣

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APPENDIX B

SURVEY INSTRUMENT

FOR OFFICE USE ONLY

NASA Scientific and Technical Information System

USE OF SCALE: Mark your opinion with a check (√).

Scientific research is important ☑ ☐ ☐ ☐ ☐ unimportant

Check 1 for "very important"
Check 2 for "somewhat important"
Check 3 for "neither important nor unimportant"
Check 4 for "somewhat unimportant"
Check 5 for "very unimportant"

These questions are designed to determine familiarity with and use of selected NASA STI publications and services.

1. Does your institution or organization subscribe to or receive NASA technical reports?

_____ yes _____ no _____ don't know

2. Does your institution or organization subscribe to or receive such NASA announcement media and abstracting tools as Scientific and Technical Aerospace Reports (STAR) and International Aerospace Abstracts (IAA)?

2 STAR _____ yes _____ no _____ don't know

3 IAA _____ yes _____ no _____ don't know

3. For my research, NASA scientific and technical information is:

4 important ☐ ☐ ☐ ☐ ☐ unimportant

4. For my research, I use: (check appropriate boxes)

	Always	Usually	Sometimes	Never	Unfamiliar with
5 a. STAR (Scientific and Technical Aerospace Reports), the NASA announcement journal for report literature	☐	☐	☐	☐	☐
6 b. IAA (International Aerospace Abstract), the NASA announcement journal for periodicals, meeting papers, and conference proceedings	☐	☐	☐	☐	☐
7 c. SCAN (Selected Current Aerospace Notices), a NASA current awareness publication	☐	☐	☐	☐	☐
8 d. NASA literature searches obtained through the NASA Scientific and Technical Information Facility, NASA libraries, Defense Technical Information Center, or Department of Energy	☐	☐	☐	☐	☐
9 e. NASA SP-7037 "Aeronautical Engineering Continuing Bibliography"	☐	☐	☐	☐	☐

5. In terms of "advancing the state-of-the-art", NASA scientific and technical information is

10 important ☐ ☐ ☐ ☐ ☐ unimportant

6. For my research, NASA technical reports are ordered:

11 frequently ☐ ☐ ☐ ☐ ☐ infrequently _____ not ordered

7. NASA technical reports, when ordered, arrive:

12 quickly ☐ ☐ ☐ ☐ ☐ slowly ____ do not arrive _____ not applicable

Use of Scientific and Technical Information

These questions are designed to determine use of published scientific and technical information.

8. Do you use **non-NASA published literature** in your research?

13 a. technical report literature ____ yes ____ no

14 b. journal articles ____ yes ____ no

15 c. conference/meeting papers ____ yes ____ no

9. Do you use **NASA authored published literature** in your research?

16 a. technical report literature ____ yes ____ no ____ not sure

17 b. journal articles ____ yes ____ no ____ not sure

18 c. conference/meeting papers ____ yes ____ no ____ not sure

10. Do you use literature published by the **Langley Research Center** in your research?

19 a. technical report literature ____ yes ____ no ____ not sure

20 b. journal articles ____ yes ____ no ____ not sure

21 c. conference/meeting papers ____ yes ____ no ____ not sure

Perceived Image of Langley Authored Scientific and Technical Information

These questions are designed to determine the perceived image (value) of **Langley-authored** (published) scientific and technical information.

22 11. When compared to other journal articles in my discipline, the PRESTIGE of Langley-authored journal articles is — higher ☐ ☐ ☐ ☐ ☐ lower ____ not familiar with those from Langley

23 12. When compared to other technical report literature in my discipline, the PRESTIGE of Langley-authored technical reports is — higher ☐ ☐ ☐ ☐ ☐ lower ____ not familiar with those from Langley

24 13. When compared to other technical report literature in my discipline, the ADEQUACY OF DATA in Langley-authored technical reports is — higher ☐ ☐ ☐ ☐ ☐ lower ____ not familiar with those from Langley

25 14. When compared to other technical report literature, the ORGANIZATION (format) of Langley-authored technical reports is — more readable ☐ ☐ ☐ ☐ ☐ less readable ____ not familiar with those from Langley

26 15. When compared to other technical report literature, the QUALITY OF VISUAL PRESENTATIONS in Langley-authored technical reports (e.g., graphics, photography, type style) is — higher ☐ ☐ ☐ ☐ ☐ lower ____ not familiar with those from Langley

27 16. In terms of "ADVANCING THE STATE-OF-THE-ART", Langley-authored scientific and technical information is — important ☐ ☐ ☐ ☐ ☐ unimportant ____ not familiar with those from Langley

Background

The purpose of these questions is to determine whether people with different backgrounds all have different opinions. The answers will NOT be used to try to identify anyone.

17. Years of professional work experience (check one only)

28 _____ less than one year _____ 1–5 years _____ 6–10 years
_____ 11–15 years _____ 16–20 years _____ 21+ years

18. Type of organization (check one only)

29 _____ industrial organization _____ educational institution
_____ not-for-profit organization _____ government agency
_____ other (please specify) _____

19. Present professional duties (check one only)

30 _____ basic research _____ applied research
_____ teaching/academic (may include research) _____ technical administration
_____ private consultant _____ other (please specify) _____

20. Major field of interest

31 _____ Aeronautics _____ Astronautics _____ Chemistry and Materials
_____ Engineering _____ Geosciences _____ Life Sciences
_____ Math and Computer Sciences _____ Physics _____ Space Sciences

21. In terms of my professional advancement/development, publishing is

32 important ☐ ☐ ☐ ☐ ☐ unimportant

22. Regarding publication, my management is

33 supportive ☐ ☐ ☐ ☐ ☐ unsupportive

23. Through which publication media do you publish? (Indicate by numeric sequence, 1 indicating most frequently used.)

34 _____ do not publish _____ journal articles
_____ technical reports _____ conference/meeting papers
_____ computer programs _____ other (please specify) _____

35 24. How many technical/professional conferences (e.g., workshops, symposia, meetings) other than NASA conferences have you attended within the last three years? _____

36 25. How many NASA technical/professional conferences (e.g., workshops, symposia, meetings) have you attended within the last three years? _____

_____ Group number
(This is not used to identify you personally.)

APPENDIX B

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PROGRAM IMPROVEMENT (Please fill this out last.)

1. Are there comments you would like to add about topics covered in this questionnaire?

2. Are there comments you would like to add about anything not previously mentioned?

3. What can be done to make Langley-generated research more accessible to you?

APPENDIX C

Continental Research

4500 Colley Avenue
Norfolk, Va. 23508
(804) 489-4887

December, 1980

Thank you for your willingness to participate in the survey phase of this study being done for Langley Research Center. This is one phase of a project to review and evaluate the scientific and technical information program.

Your opinions are vital. Please complete the enclosed anonymous survey today and return it to me at Continental Research, P. O. Box 6112, Norfolk, Virginia 23508, using the pre-paid envelope provided.

Your cooperation is appreciated.

Sincerely,

Nanci Glassman

Nanci A. Glassman
President

js

Enclosures: 1 pre-test survey
1 pre-paid envelope
1 post card

APPENDIX D

Continental Research

4500 Colley Avenue
Norfolk, Va. 23508
(804) 489-4887

December 16, 1980

Just a note to thank you for your willingness to participate in our survey for Langley Research Center.

Someone from my office tried to call you last week to be certain that the survey had arrived and to thank you for your help. Since you were unavailable, I just wanted to be sure you know how much your effort was appreciated.

Thanks so much!

Nanci Glassman

Nanci A. Glassman
President

lo

OMB No. 2700-0029

APPENDIX E

QUESTIONNAIRE WITH AGGREGATE TALLIES

ALL FIGURES ARE PERCENTAGES THAT TOTAL 100%
SAMPLE SIZE = 381

NASA Scientific and Technical Information System

POST OFFICE USE ONLY

USE OF SCALE: Mark your opinion with a check (✓).

Scientific research is important ☑ ☐ ☐ ☐ ☐ unimportant

Check 1 for "very important"
Check 2 for "somewhat important"
Check 3 for "neither important nor unimportant"
Check 4 for "somewhat unimportant"
Check 5 for "very unimportant"

These questions are designed to determine familiarity with and use of selected NASA STI publications and services.

1. Does your institution or organization subscribe to or receive NASA technical reports?

82.9 yes 3.5 no 11.5 don't know

2. Does your institution or organization subscribe to or receive such NASA announcement media and abstracting tools as Scientific and Technical Aerospace Reports (STAR) and International Aerospace Abstracts (IAA)?

STAR 60.4 yes 12.1 no 27.6 don't know

IAA 44.1 yes 15.5 no 40.4 don't know

3. For my research, NASA scientific and technical information is

important ☐ ☐ ☐ ☐ ☐ unimportant N/A 3.9 (No answer)
43.6 28.6 14.7 5.5 3.7

4. For my research, I use: (check appropriate boxes)

	Always	Usually	Sometimes	Never	Unfamiliar with	N/A
a. STAR (Scientific and Technical Aerospace Reports), the NASA announcement journal for report literature	11.5 ☐	18.6 ☐	35.2 ☐	7.9 ☐	26.8 ☐	
b. IAA (International Aerospace Abstract), the NASA announcement journal for periodicals, meeting papers, and conference proceedings	5.0 ☐	10.0 ☐	32.8 ☐	10.5 ☐	41.7 ☐	
c. SCAN (Selected Current Aerospace Notices), a NASA current awareness publication	4.5 ☐	8.4 ☐	18.6 ☐	14.7 ☐	53.8 ☐	
d. NASA literature searches obtained through the NASA Scientific and Technical Information Facility, NASA libraries, Defense Technical Information Center, or Department of Energy	6.0 ☐	11.0 ☐	34.9 ☐	18.9 ☐	29.1 ☐	
e. NASA SP-7037 "Aeronautical Engineering Continuing Bibliography"	1.6 ☐	4.2 ☐	10.8 ☐	19.9 ☐	63.5 ☐	

5. In terms of "advancing the state-of-the-art", NASA scientific and technical information is

important ☐ ☐ ☐ ☐ ☐ unimportant N/A - (no answer) 4.2
43.0 37.0 11.3 2.6 1.8

6. For my research, NASA technical reports are ordered:

frequently ☐ ☐ ☐ ☐ ☐ infrequently 13.1 not ordered
16.0 25.2 25.2 10.0 10.5

7. NASA technical reports, when ordered, arrive:

quickly ☐ ☐ ☐ ☐ ☐ slowly 0.0 do not arrive 22.3 not applicable
9.2 25.2 31.2 7.1 5.0

Use of Scientific and Technical Information

These questions are designed to determine use of published scientific and technical information.

8. Do you use non-NASA published literature in your research?

a. technical report literature	95.3 yes	2.4 no	2.4 - N/A - (no answer)
b. journal articles	96.9 yes	1.8 no	1.3 - N/A
c. conference/meeting papers	96.1 yes	2.4 no	1.6 - N/A

9. Do you use NASA authored published literature in your research?

a. technical report literature	86.1 yes	8.4 no	5.5 not sure
b. journal articles	84.8 yes	9.4 no	5.8 not sure
c. conference/meeting papers	85.8 yes	7.9 no	6.3 not sure

10. Do you use literature published by the Langley Research Center in your research?

a. technical report literature	75.1 yes	13.1 no	11.8 not sure
b. journal articles	71.9 yes	13.1 no	15.0 not sure
c. conference/meeting papers	74.3 yes	12.3 no	13.4 not sure

Perceived Image of Langley Authored Scientific and Technical Information

These questions are designed to determine the perceived image (value) of Langley-authored (published) scientific and technical information.

11. When compared to other journal articles in my discipline, the PRESTIGE of Langley-authored journal articles is

	9.2	26.0	41.7	3.9	1.0		18.1	
higher	☐	☐	☐	☐	☐	lower	not familiar with those from Langley	

12. When compared to other technical report literature in my discipline, the PRESTIGE of Langley-authored technical reports is

	11.0	30.4	36.0	4.2	0.8		17.6	
higher	☐	☐	☐	☐	☐	lower	not familiar with those from Langley	

13. When compared to other technical report literature in my discipline, the ADEQUACY OF DATA in Langley-authored technical reports is

	13.4	34.1	32.5	1.3	0.3		18.4	
higher	☐	☐	☐	☐	☐	lower	not familiar with those from Langley	

14. When compared to other technical report literature, the ORGANIZATION (format) of Langley-authored technical reports is

	13.6	33.9	32.3	2.4	0.3		17.6	
more readable	☐	☐	☐	☐	☐	less readable	not familiar with those from Langley	

15. When compared to other technical report literature, the QUALITY OF VISUAL PRESENTATIONS in Langley-authored technical reports (e.g., graphics, photography, type style) is

	16.5	33.1	29.1	3.1	0.5		17.6	
higher	☐	☐	☐	☐	☐	lower	not familiar with those from Langley	

16. In terms of "ADVANCING THE STATE-OF-THE-ART", Langley-authored scientific and technical information is

	22.8	32.5	26.8	2.6	1.0		14.2	
important	☐	☐	☐	☐	☐	unimportant	not familiar with those from Langley	

Background

The purpose of these questions is to determine whether people with different backgrounds all have different opinions. The answers will NOT be used to try to identify anyone.

17. Years of professional work experience (check one only)

28

0.0 less than one year	2.9 1–5 years	7.9 6–10 years	
22.0 11–15 years	21.3 16–20 years	45.7 21+ years	0.3 - N/A

18. Type of organization (check one only)

29

67.2 industrial organization	28.1 educational institution
3.7 not-for-profit organization	1.0 government agency
_____ other (please specify) _____	

19. Present professional duties (check one only)

30

51.7	basic research/applied research
23.4	teaching/academic (may include research)
34.7	private consultant/technical administration
0.3 - N/A	

20. Major field of interest

31

39.9	Aeronautics/Astronautics	8.4	Geosciences/Life Sciences/Space Sciences
7.1	Chemistry & Materials/Physics	31.5	Engineering (where that was the only item checked)
12.1	Math and Computer Science	1.0	N/A

21. In terms of my professional advancement/development, publishing is

32

important ☐ ☐ ☐ ☐ ☐ unimportant

40.4 25.7 16.3 12.1 5.5

22. Regarding publication, my management is

33

supportive ☐ ☐ ☐ ☐ ☐ unsupportive N/A

45.1 29.1 18.9 5.2 1.3 0.3

23. Through which publication media do you publish? (Indicate by numeric sequence, 1 indicating most frequently used.)

34

7.1 - do not publish

91.6 - do publish

1.3 - N/A

24. How many technical/professional conferences (e.g., workshops, symposia, meetings) other than NASA conferences have you attended within the last three years? 4.2 - none 64.3 - one to eight 31.5 - 9 or more

35

25. How many NASA technical/professional conferences (e.g., workshops, symposia, meetings) have you attended within the last three years? _____

36

20.5 - none
23.6 - one
24.9 - two
15.3 - three
3.9 - four
3.9 - five
3.4 - six
1.0 - seven
0.3 - eight
3.1 - nine or more

COAST

44.4 - Eastern
21.8 - Central
4.5 - Mountain
29.4 - Pacific

_____ Group number (This is not used to identify you personally.)

(From initial Phone Call - Do you use NASA or LaRC published information in your work?)

3.4 - used neither
17.6 - used NASA only
2.1 - used Langley only
74.0 - used both
2.9 - N/A

APPENDIX F

QUESTIONNAIRE WITH AGGREGATE TALLIES WITHOUT "DON'T KNOW" RESPONSES

FOR OFFICE USE ONLY

NASA Scientific and Technical Information System

ALL DECIMAL FIGURES ARE PERCENTAGES

ALL WHOLE NUMBERS ARE " # of people "

SAMPLE SIZE = 381

USE OF SCALE: Mark your opinion with a check (✓).

Scientific research is important ☑ ☐ ☐ ☐ ☐ unimportant

Check 1 for "very important"
Check 2 for "somewhat important"
Check 3 for "neither important nor unimportant"
Check 4 for "somewhat unimportant"
Check 5 for "very unimportant"

These questions are designed to determine familiarity with and use of selected NASA STI publications and services.

1. Does your institution or organization subscribe to or receive NASA technical reports?

82.9 yes 5.5 no 11.5 don't know

2. Does your institution or organization subscribe to or receive such NASA announcement media and abstracting tools as Scientific and Technical Aerospace Reports (STAR) and International Aerospace Abstracts (IAA)?

STAR 60.4 yes 12.1 no 27.6 don't know

IAA 44.1 yes 15.5 no 40.4 don't know

3. For my research, NASA scientific and technical information is

important ☐ ☐ ☐ ☐ ☐ unimportant 15 people N/A

45.4 29.8 15.3 5.7 3.8

4. For my research, I use: (check appropriate boxes)

	Always	Usually	Sometimes	Never	Unfamiliar with
	Percentages				
a. STAR (Scientific and Technical Aerospace Reports), the NASA announcement journal for report literature	15.8 ☐	25.4 ☐	48.0 ☐	10.8 ☐	102 people ☐
b. IAA (International Aerospace Abstract), the NASA announcement journal for periodicals, meeting papers, and conference proceedings	8.6 ☐	17.1 ☐	56.3 ☐	18.0 ☐	159 people ☐
c. SCAN (Selected Current Aerospace Notices), a NASA current awareness publication	9.7 ☐	18.2 ☐	40.3 ☐	31.8 ☐	205 people ☐
d. NASA literature searches obtained through the NASA Scientific and Technical Information Facility, NASA libraries, Defense Technical Information Center, or Department of Energy	8.5 ☐	15.6 ☐	49.3 ☐	26.7 ☐	111 people ☐
e. NASA SP-7037 "Aeronautical Engineering Continuing Bibliography"	4.3 ☐	11.5 ☐	29.5 ☐	54.7 ☐	242 people ☐

5. In terms of "advancing the state-of-the-art", NASA scientific and technical information is

important ☐ ☐ ☐ ☐ ☐ unimportant 16 people N/A

44.9 38.6 11.8 2.7 1.9

6. For my research, NASA technical reports are ordered:

frequently ☐ ☐ ☐ ☐ ☐ infrequently 50 people not ordered

18.4 29.0 29.0 11.5 12.1

7. NASA technical reports, when ordered, arrive:

quickly ☐ ☐ ☐ ☐ ☐ slowly 0 do not arrive 85 people not applicable

11.8 32.4 40.2 9.1 6.4

Use of Scientific and Technical Information

These questions are designed to determine use of published scientific and technical information.

8. Do you use non-NASA published literature in your research?

13	a. technical report literature	97.6 yes	2.4 no	9 people	N/A	
14	b. journal articles	98.1 yes	1.9 no	5 people	N/A	
15	c. conference/meeting papers	97.6 yes	2.4 no	6 people	N/A	

9. Do you use NASA authored published literature in your research?

16	a. technical report literature	91.1 yes	8.9 no	21 people	not sure
17	b. journal articles	90.0 yes	10.0 no	22 people	not sure
18	c. conference/meeting papers	91.6 yes	8.4 no	24 people	not sure

10. Do you use literature published by the Langley Research Center in your research?

19	a. technical report literature	85.1 yes	14.9 no	45 people	not sure
20	b. journal articles	84.6 yes	15.4 no	57 people	not sure
21	c. conference/meeting papers	85.8 yes	14.2 no	51 people	not sure

Perceived Image of Langley Authored Scientific and Technical Information

These questions are designed to determine the perceived image (value) of Langley-authored (published) scientific and technical information.

11. When compared to other journal articles in my discipline, the PRESTIGE of Langley-authored journal articles is

22 — 11.2 | 31.7 | 51.0 | 4.8 | 1.3 — higher ☐ ☐ ☐ ☐ ☐ lower — 69 people — not familiar with those from Langley

12. When compared to other technical report literature in my discipline, the PRESTIGE of Langley-authored technical reports is

23 — 13.4 | 33.9 | 43.6 | 5.1 | 1.0 — higher ☐ ☐ ☐ ☐ ☐ lower — 67 people — not familiar with those from Langley

13. When compared to other technical report literature in my discipline, the ADEQUACY OF DATA in Langley-authored technical reports is

24 — 16.4 | 41.8 | 39.9 | 1.6 | 0.3 — higher ☐ ☐ ☐ ☐ ☐ lower — 70 people — not familiar with those from Langley

14. When compared to other technical report literature, the ORGANIZATION (format) of Langley-authored technical reports is

25 — 16.6 | 41.1 | 39.2 | 2.9 | 0.3 — more readable ☐ ☐ ☐ ☐ ☐ less readable — 67 people — not familiar with those from Langley

15. When compared to other technical report literature, the QUALITY OF VISUAL PRESENTATIONS in Langley-authored technical reports (e.g., graphics, photography, type style) is

26 — 20.1 | 40.1 | 35.4 | 3.8 | 0.6 — higher ☐ ☐ ☐ ☐ ☐ lower — 67 people — not familiar with those from Langley

16. In terms of "ADVANCING THE STATE-OF-THE-ART", Langley-authored scientific and technical information is

27 — 26.6 | 37.9 | 31.2 | 3.1 | 1.2 — important ☐ ☐ ☐ ☐ ☐ unimportant — 54 people — not familiar with those from Langley

Background

The purpose of these questions is to determine whether people with different backgrounds all have different opinions. The answers will NOT be used to try to identify anyone.

17. Years of professional work experience (check one only)

0.0 less than one year	2.9 1–5 years	7.9 6–10 years	1 person N/A
22.1 11–15 years	21.3 16–20 years	45.8 21+ years	

18. Type of organization (check one only)

67.2 industrial organization	28.1 educational institution
3.7 not-for-profit organization	1.0 government agency
0.0 other (please specify) _____	

19. Present professional duties (check one only)

51.8 basic research / applied research — 1 person N/A

23.4 teaching/academic (may include research)

24.7 private consultant/tech. administration

20. Major field of interest

40.3 Aeronautics/Astronautics	8.5 Geosciences/Life Sciences/Space Sciences
7.2 Chemistry & Materials/Physics	31.8 Engineering (where that was the only item checked)
12.1 Math & Computer Science	4 people N/A

21. In terms of my professional advancement/development, publishing is

important ☐ ☐ ☐ ☐ ☐ unimportant

40.4 25.7 16.3 12.1 5.5

22. Regarding publication, my management is

supportive ☐ ☐ ☐ ☐ ☐ unsupportive 1 person N/A

45.3 29.2 18.9 5.3 1.3

23. Through which publication media do you publish? (Indicate by numeric sequence, 1 indicating most frequently used.)

7.2 do not publish 92.8 do publish 5 people N/A

24. How many technical/professional conferences (e.g., workshops, symposia, meetings) other than NASA conferences have you attended within the last three years? 4.2 - none 64.1 - one to eight 31.5 - 9 or more

25. How many NASA technical/professional conferences (e.g., workshops, symposia, meetings) have you attended within the last three years?

20.5 - none	3.9 - five
23.6 - one	3.4 - six
24.9 - two	1.0 - seven
15.3 - three	0.3 - eight
3.9 - four	3.1 - nine or more

COAST

44.4 - Eastern
21.8 - Central
4.5 - Mountain
29.4 - Pacific

_____ Group number (This is not used to identify you personally.)

(From initial Phone Call - Do you use NASA or LaRC published info. in your work?)

3.5 - used neither
18.1 - used NASA only
2.2 - used Langley only
76.2 - used both
11 people - N/A